

The Office Action rejects claims 1, 2 and 5-8 under 35 U.S.C. §103(a) as unpatentable over FR 2339263 to Baroin in view of WO 90/07211 to Hoffmann et al. (Hoffmann); claim 3 over Baroin in view of Hoffmann and further in view of U.S. Patent 5,744,889 to Niimi; and claim 4 over Baroin in view of Hoffmann and further in view of U.S. Patent 5,701,046 to Kammerer et al. (Kammerer). As claims 1-8 are deleted, the rejection of claims 1-8 is moot.

Applicants assert that none of the applied references disclose or suggest all of the features recited in new claims 9-11. For example, none of Baroin, Hoffman, Niimi or Kammerer disclose or suggest a method of manufacturing a brush element of a rotary electric machine to be brought by a spring in contact with a commutator, the method comprising the steps of filling a first conduction powder into a female die to form a stairs shape having a higher step and lower step, adding a second conduction powder that has lower conductivity than the first conduction powder to the lower step so that a surface of the second conduction powder can be flush with a surface of the first conduction powder thereby forming a layer of the second conduction powder having a thickness that corresponds to a difference between the higher step and the lower step, and pressing and hardening the first and second conduction powders to form a mold.

Rather, Baroin discloses a carbon brush for a rotating machine that has a main body for support to which a conductor is fixed and a layer of thermal carbon on one surface to form a wearing surface. The thermal carbon is deposited directly from a vapor phase onto the main body of the brush and may then be coated with graphite. The layer may also be made of an expanding/compressible graphite loaded with an abrasive material. Thus, Baroin does not disclose or suggest a step of filling a first conduction powder into a female die to form a stairs shape.

Hoffmann discloses a trolley shoe comprising a pressing made from a first graphite work piece and carrying on one of its lateral surfaces, a surface layer made from a second

graphite work piece of lower conductivity, the trolley shoe further comprising a power conducting line which emerges from the trolley shoe in the region of that part of the lateral face not covered by the surface layer. When manufacturing the trolley shoe, the layer is formed in an initial pressing operation and then subjected to a final pressing operation together with the first graphite work piece with the power conducting line embedded in it. In other words, the manufacturing process disclosed by Hoffmann is a two-step process which increases the expense and complexity of the manufacturing process. In contrast, Applicants claim a single pressing step in the manufacturing process recited in claims 9-11.

Additionally, in Hoffmann, a rectilinear pre-pressed blank 2 is added in the process of manufacturing instead of a second conduction powder as recited in the claims.

Niimi merely discloses a commutator having a sliding surface formed by arranging a plurality of segments insulated with each other into a circle on a plane which is substantially perpendicular to a shaft provided at one end of an armature. Niimi does not disclose or suggest a method of making a multi-layered brush.


Kammerer discloses a process for the production of multi-layered brushes comprising charging a mold with at least one electrically conductive powder and compressing the contents of the mold with a piston to form a crude brush. The charging of the mold involves at least the simultaneous introduction of at least two conductive powders, each of the simultaneously introduced powders flowing through the upper orifice of the mold in a distinct flux of material flowing to the separating means so as to obtain, after the compression stage and heat treatment, a brush formed by integral blocks, each of the blocks comprising one of the powders introduced into the mold (col. 2, line 59 - col. 3, line 10). As such, Kammerer does not disclose or suggest the method of manufacturing a brush element as recited in the claims. Rather, Kammerer merely discloses a method to produce a multi-layered brush consisting of blocks oriented in the direction of brush wear so as to increase the life of the

brush. Accordingly, Applicants submit that none of applied references whether considered singularly or in combination disclose or suggest the features recited in claims 9-11.

In view of the foregoing, reconsideration of the application is requested. It is submitted that the claims as presented herein patentably distinguish over the applied references and fully meet the requirements of 35 U.S.C. §112. Accordingly, allowance of claims 9-11 is respectfully solicited.

Should the Examiner believe anything further is desirable in order to place the application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

  
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